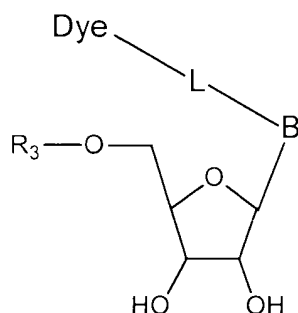


**IN THE CLAIMS:**

Claims 1-100 (cancelled)

Claim 101 (previously presented). A method for determining a polynucleotide sequence, comprising

- (i) annealing at least one primer to a template polynucleotide;
- (ii) extending said at least one primer in the presence of a mixture of unlabeled dNTPs and at least one dye-labeled ribonucleotide having the formula:



wherein B is a nucleobase; L is a linker; R<sub>3</sub> is triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof, and Dye is a reporter group;

so that primer extension products that contain at least one dye-labeled ribonucleotide are formed;

- (iii) cleaving one or more primer extension products to form a plurality of labeled fragments;
- (iv) separating the extension products by size; and
- (v) detecting the fragments to determine the polynucleotide sequence.

Claim 102 (original). The method according to claim 101, wherein the dye-labeled ribonucleotides are rATP-PA-6R6G, rCTP-PA-Rox, rUTP-PA-Tamra and rGTP-EO-R110.

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Claim 103 (original). The method according to claim 101, wherein one primer is biotinylated.

Claim 104 (original). The method according to claim 101, wherein at least one primer is a hybridization based pull-out primer.

Claim 105 (original). The method according to claim 101, wherein the DNA polymerase is a thermostable DNA polymerase.

Claim 106 (original). The method according to claim 105, wherein the thermostable DNA polymerase is a modified thermostable DNA polymerase having increased efficiency for the incorporation of ribonucleotides.

Claim 107 (original). The method according to claim 101, wherein the means for hydrolyzing the extension products at each occurrence of a ribonucleotide is alkali treatment, heat treatment, or a ribonuclease.

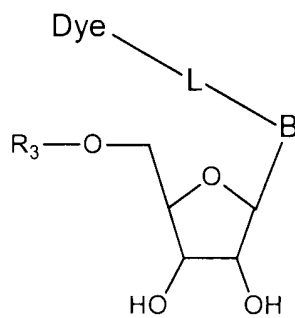
Claim 108 (currently amended). A method for detecting mutations in DNA a polynucleotide, comprising

- annealing two oligonucleotide primers to a template polynucleotide;

- incubating extending the two oligonucleotide primers with a DNA polymerase

~~that can incorporate both dNTPs and rNTPs in a reaction comprising~~ in the presence of

a mixture of unlabeled dNTPs and at least one dye-labeled ribonucleotide ~~of the invention~~ having the formula:



wherein B is a nucleobase; L is a linker; R<sub>3</sub> is triphosphate, α-thiotriphosphate, or a salt thereof, and Dye is a reporter group;

so that primer extension products that contain at least one dye-labeled ribonucleotide are formed;

- ~~treating the~~ cleaving one or more primer extension products ~~with a means for~~  
~~hydrolyzing the extension products at each occurrence of a ribonucleotide to produce to~~  
form a plurality of labeled fragments;

- ~~resolving~~ separating the fragments by size; and
- detecting the fragments to detect the mutations.

Claim 109 (currently amended). The method according to claim 108, wherein the fragments that contain primers are separated from other fragments before the fragments that contain primers are resolved separated by size.

Claim 110 (original). The method according to claim 108, wherein the mutation is a single nucleotide polymorphism.

Claim 111 (currently amended). The method according to claim 108, wherein the DNA polynucleotide is genomic DNA.

Claim 112 (original). The method according to claim 108, wherein at least one primer is biotinylated.

Claim 113 (original). The method according to claim 108, wherein at least one primer is a hybridization based primer.

Claim 114 (original). The method according to claim 108, wherein one primer comprises a modified base preventing primer extension in the 5' direction.

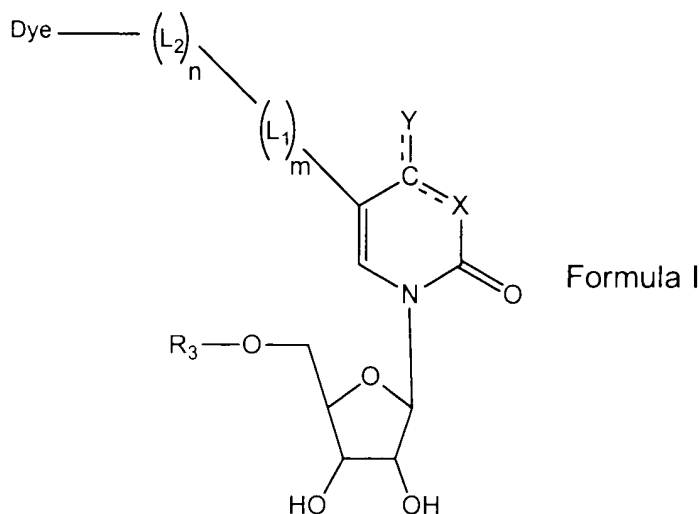
Claims 115-123 (cancelled)

Claim 124 (currently amended). The method according to claim 101, wherein said at least one dye-labeled ribonucleotide is:

(1) a compound of formula I:

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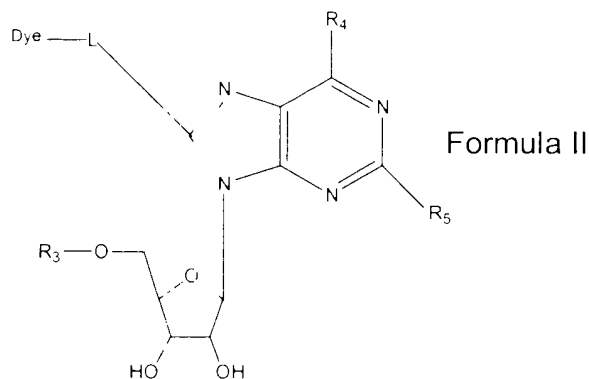
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Formula I

- wherein X is N, NH, or C;
- wherein Y is O or  $NH_2$ ;
- wherein  $R_3$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein  $L_1$  is a linker;
- wherein  $L_2$  is a benzylamine linker or a phosphate linker;
- wherein  $n = 0-4$ ,  $m = 0-4$ , and  $m + n$  is at least 1; and;
- wherein the dye is any reporter group;

(2) a compound of formula II:



Formula II

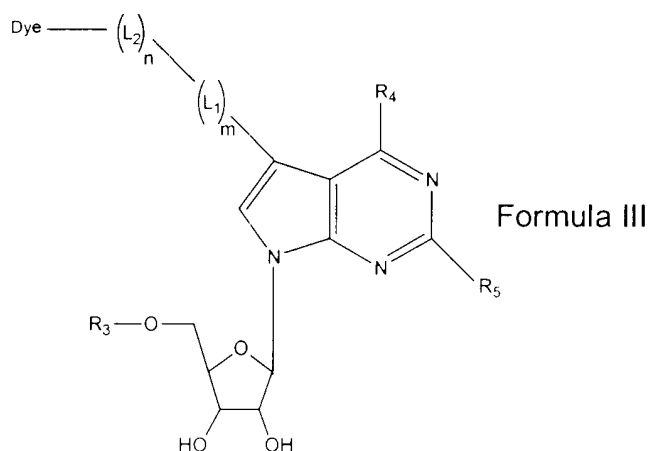
- wherein L is a linker;
- wherein  $R_4$  is either  $NH_2$ ,  $OH$ , or  $O$ , and  $B$  is either  $NH_2$ ,  $OH$ , or  $H$ ;

- wherein  $R_3$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;

and

- wherein the dye is any reporter group;

(3) a compound of ~~formula~~ formula III:



- wherein  $L_1$  is a linker;

- wherein  $L_2$  is a benzylamine linker or a phosphate linker;

- wherein  $n = 0-4$ ,  $m = 0-4$ , and  $m + n$  is at least 1;

- wherein  $R_4$  is either  $NH_2$ ,  $OH$ , or  $O$ , and  $R_5$  is either  $NH_2$ ,  $OH$ , or  $H$ ;

- wherein  $R_3$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;

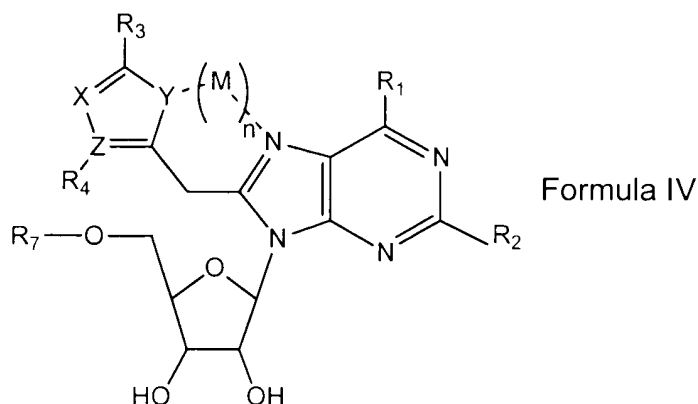
and

- wherein the dye is any reporter group;

(4) a compound of formula IV:

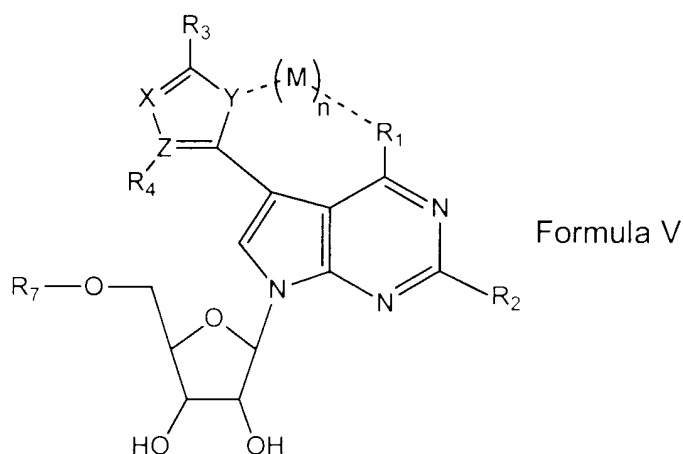
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- wherein  $R_1$ ,  $R_2$ , and  $R_4$  are independently H, O, OR, S, SR,  $NR_2$  or  $CR_2$ ;
- wherein  $R_3$  is SR,  $NR_2$ , OR, or  $CR_2$  and comprises a reporter group;
- wherein R is hydrogen, alkyl, aryl, or an amino acid;
- wherein  $R_7$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein X, Y, and Z are independently carbon, nitrogen, oxygen, sulfur, phosphorus, or selenium;
- wherein n is 0 or 1; and
- wherein M is  $H_2O$  or any metal;

(5) a compound of formula V:



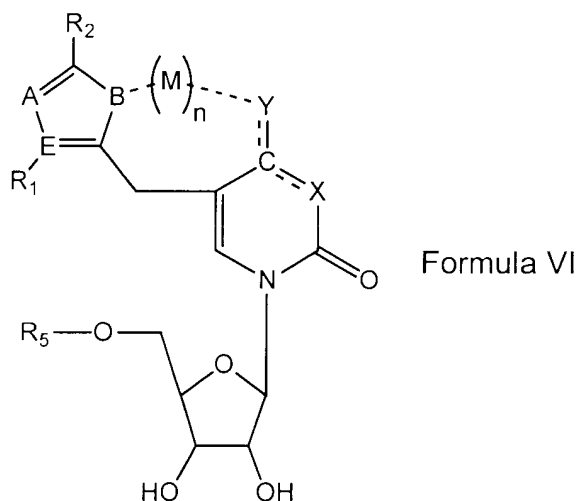
- wherein  $R_1$ ,  $R_2$ , and  $R_4$  are independently H, O, OR, S, SR,  $NR_2$  or  $CR_2$ ;
- wherein  $R_3$  is SR,  $NR_2$ , OR, or  $CR_2$  and comprises a reporter group;

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- wherein R is hydrogen, alkyl, aryl, or an amino acid;
- wherein R<sub>7</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein X, Y, and Z are independently carbon, nitrogen, oxygen, sulfur, phosphorus, or selenium;
- wherein n is 0 or 1; and
- wherein M is H<sub>2</sub>O or any metal;

(6) a compound of formula VI:

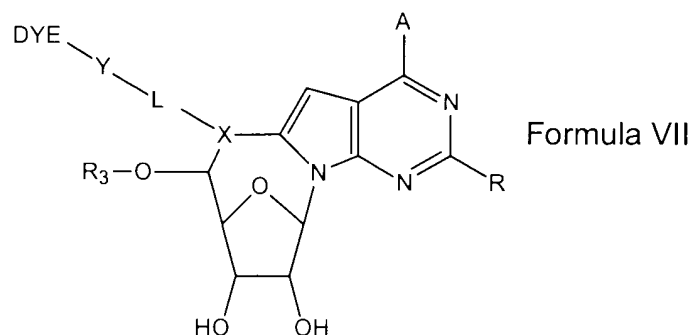


- wherein R<sub>1</sub> is H, O, OR, S, SR, NR<sub>2</sub>, or CR<sub>2</sub>;
- wherein R<sub>2</sub> is SR, NR<sub>2</sub>, OR, or CR<sub>2</sub> and comprises a reporter group;
- wherein R is hydrogen, alkyl, alkynyl, aryl, or an amino acid;
- wherein R<sub>5</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein X is N, NH, or C;
- wherein Y is O or NH<sub>2</sub>;
- wherein A, B, and E are independently C, N, O, S, P, or Se;
- wherein n is 0 or 1; and



- wherein M is H<sub>2</sub>O or any metal;

(7) a compound of formula VII:



- wherein A is NH<sub>2</sub>, OH, or O;

- wherein R is H, O, NR'<sub>2</sub>, S, CR'<sub>2</sub>, or halide;

- wherein R' is hydrogen or alkyl;

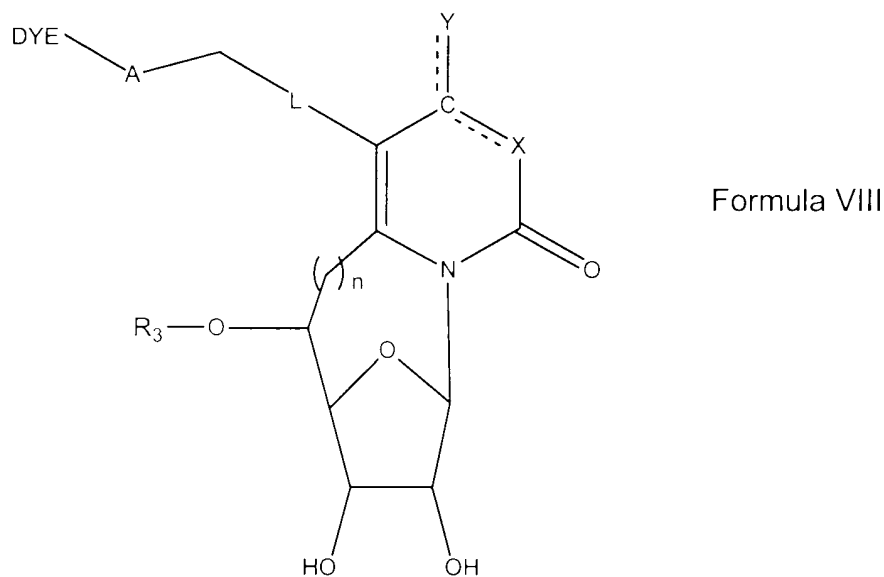
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;

- wherein L is alkyl;

- wherein X is CR or N and Y is O, S, or NH; and

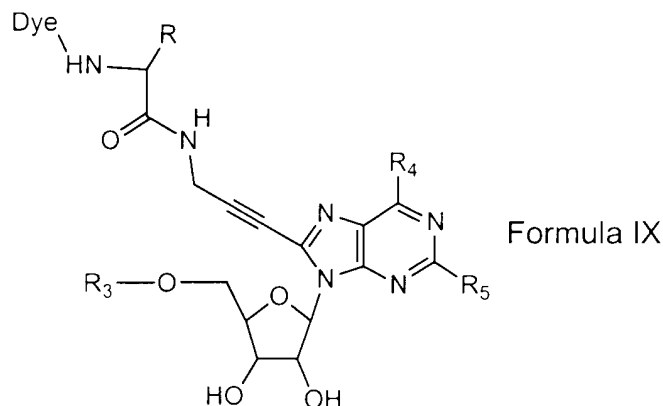
- wherein the dye is any reporter group;

(8) a compound of formula VIII:



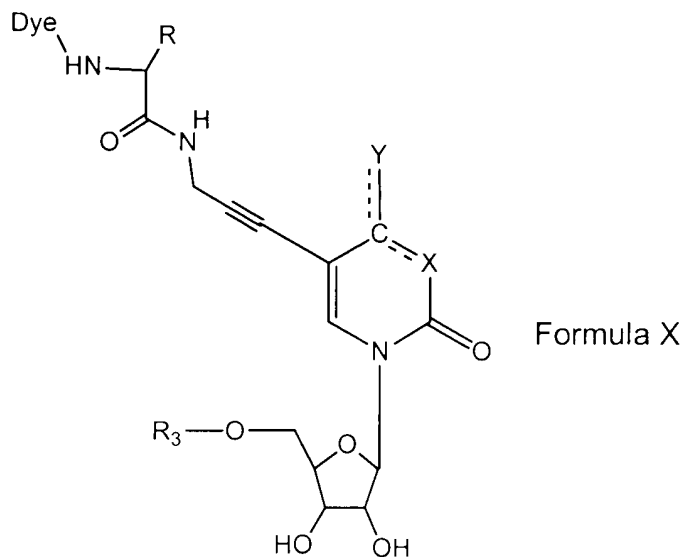
- wherein X is N, NH, or C;
- wherein Y is O or NH<sub>2</sub>;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein A is O, S, or NH;
- wherein L is alkyl or aryl substituted at from 0 to 3 positions in a chemically reasonable manner with F, Cl, Br, I, C1-C18 alkyl, Silyl, OH, OR', SH, SR', SOR', SO<sub>2</sub>R', SO<sub>3</sub>, or NR'<sub>2</sub>;
- wherein R' is hydrogen or alkyl;
- wherein n is 1 to 10; and
- wherein the dye is any reporter group;

(9) a compound of formula IX:



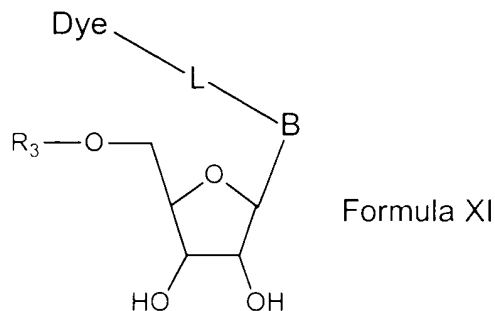
- wherein R<sub>4</sub> is NH<sub>2</sub>, OH, or O and R<sub>5</sub> is NH<sub>2</sub>, OH, or H, provided that if A is NH<sub>2</sub>, B is H and if A is O, B is NH<sub>2</sub>;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein the dye is any reporter group; and
- wherein R is a side chain for mobility tuning;

(10) a compound of formula 40 X:



- wherein X is N, NH, or C;
- wherein Y is O or NH<sub>2</sub>;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein Dye is any reporter group, and
- wherein R is a side chain for mobility tuning;

(11) a compound of formula 44 XI:



- wherein B is a nucleobase selected from uracil, cytosine, adenine, 7-deazaadenine, guanine, and 7-deazaguanine;
- wherein R<sub>3</sub> is triphosphate or a salt thereof;

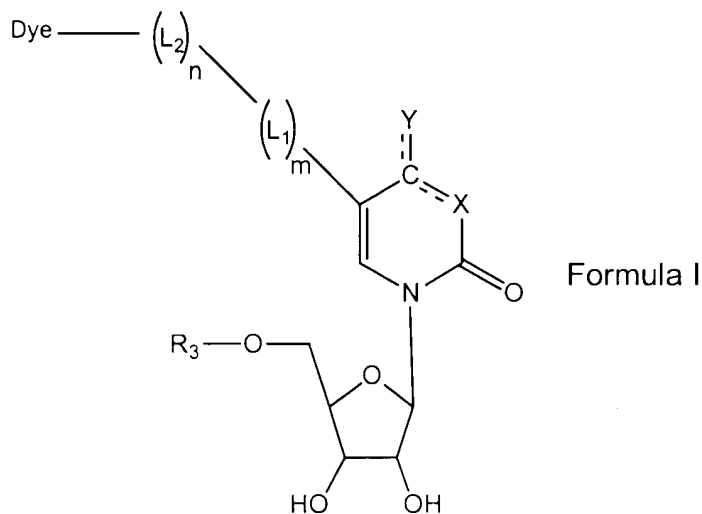
- wherein L is a linker selected from propargyl-ethyl-oxide-amino and propargylamino wherein the linker is attached to the 8-C of a adenine, 7-deazaadenine, guanine, or 7-deazaguanine nucleobase, the 7-C or 8-C of a 7-deazaadenine or 7-deazaguanine nucleobase, or the C-5 of a uracil or cytosine nucleobase; and
- wherein Dye is selected from a rhodamine dye and a fluorescein dye;
- and.

Claim 125 (previously presented). The method according to claim 101, wherein the reporter group is a rhodamine-type dye, a fluorescein-type dye, an energy transfer dye, or a cyanine-type dye.

Claim 126 (previously presented). The method according to claim 101, further comprising separating the fragments that contain at least one primer from other fragments.

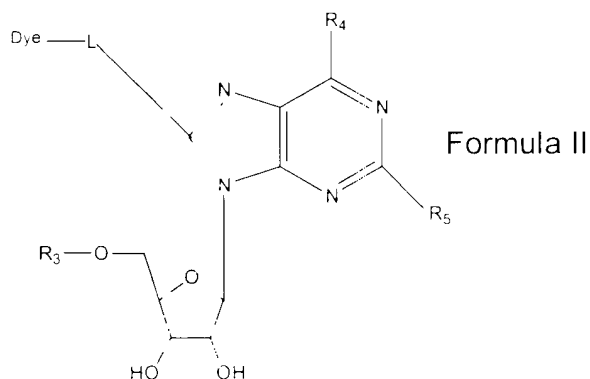
Claim 127 (new). The method according to claim 108, wherein said at least one dye-labeled ribonucleotide is:

- (1) a compound of formula I:



- wherein  $X$  is  $N$ ,  $NH$ , or  $C$ ;
- wherein  $Y$  is  $O$  or  $NH_2$ ;
- wherein  $R_3$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein  $L_1$  is a linker;
- wherein  $L_2$  is a benzylamine linker or a phosphate linker;
- wherein  $n = 0-4$ ,  $m = 0-4$ , and  $m + n$  is at least 1; and;
- wherein the dye is any reporter group;

(2) a compound of formula II:



- wherein  $L$  is a linker;
- wherein  $R_4$  is either  $NH_2$ ,  $OH$ , or  $O$ , and  $B$  is either  $NH_2$ ,  $OH$ , or  $H$ ;

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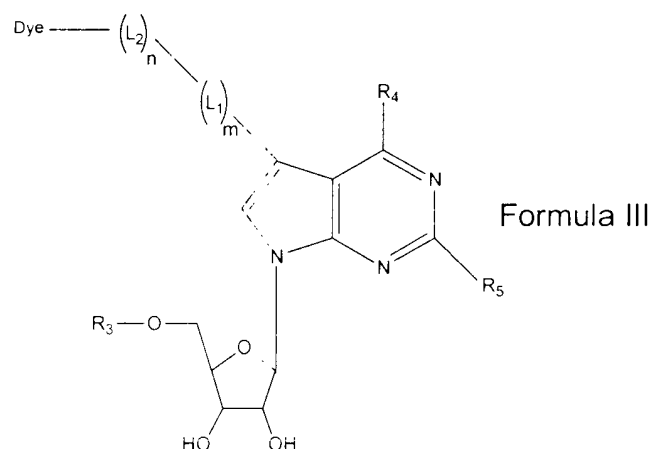
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- wherein  $R_3$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;

and

- wherein the dye is any reporter group;

(3) a compound of formula III:



- wherein  $L_1$  is a linker;

- wherein  $L_2$  is a benzylamine linker or a phosphate linker;

- wherein  $n = 0-4$ ,  $m = 0-4$ , and  $m + n$  is at least 1;

- wherein  $R_4$  is either  $NH_2$ ,  $OH$ , or  $O$ , and  $R_5$  is either  $NH_2$ ,  $OH$ , or  $H$ ;

- wherein  $R_3$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;

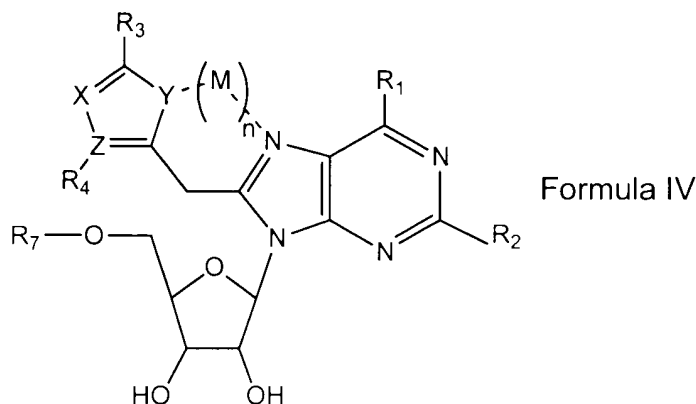
and

- wherein the dye is any reporter group;

(4) a compound of formula IV:

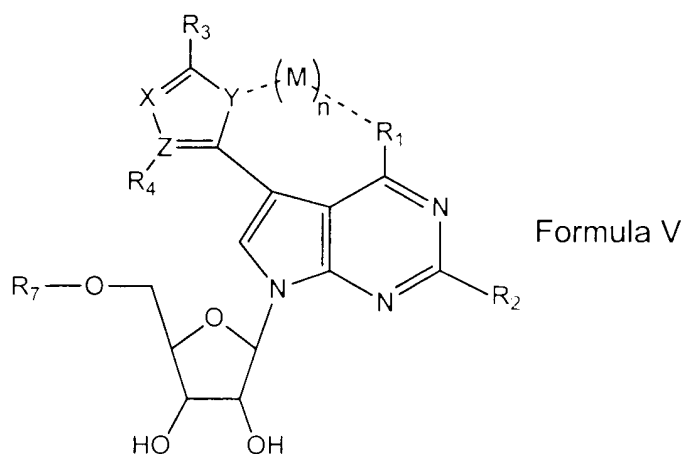
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- wherein  $R_1$ ,  $R_2$ , and  $R_4$  are independently H, O, OR, S, SR,  $NR_2$  or  $CR_2$ ;
- wherein  $R_3$  is SR,  $NR_2$ , OR, or  $CR_2$  and comprises a reporter group;
- wherein R is hydrogen, alkyl, aryl, or an amino acid;
- wherein  $R_7$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein X, Y, and Z are independently carbon, nitrogen, oxygen, sulfur, phosphorus, or selenium;
- wherein n is 0 or 1; and
- wherein M is  $H_2O$  or any metal;

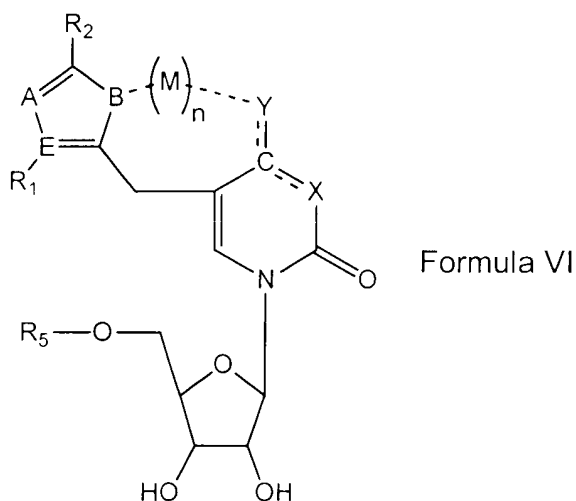
(5) a compound of formula V:



- wherein  $R_1$ ,  $R_2$ , and  $R_4$  are independently H, O, OR, S, SR,  $NR_2$  or  $CR_2$ ;
- wherein  $R_3$  is SR,  $NR_2$ , OR, or  $CR_2$  and comprises a reporter group;

- wherein R is hydrogen, alkyl, aryl, or an amino acid;
- wherein  $R_7$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein X, Y, and Z are independently carbon, nitrogen, oxygen, sulfur, phosphorus, or selenium;
- wherein n is 0 or 1; and
- wherein M is  $H_2O$  or any metal;

(6) a compound of formula VI:

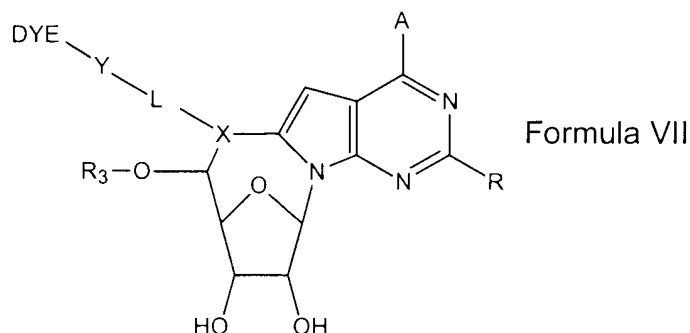


- wherein  $R_1$  is H, O, OR, S, SR,  $NR_2$ , or  $CR_2$ ;
- wherein  $R_2$  is SR,  $NR_2$ , OR, or  $CR_2$  and comprises a reporter group;
- wherein R is hydrogen, alkyl, alkynyl, aryl, or an amino acid;
- wherein  $R_5$  is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein X is N, NH, or C;
- wherein Y is O or  $NH_2$ ;
- wherein A, B, and E are independently C, N, O, S, P, or Se;
- wherein n is 0 or 1; and



- wherein M is H<sub>2</sub>O or any metal;

(7) a compound of formula VII:



- wherein A is NH<sub>2</sub>, OH, or O;

- wherein R is H, O, NR'<sub>2</sub>, S, CR'<sub>2</sub>, or halide;

- wherein R' is hydrogen or alkyl;

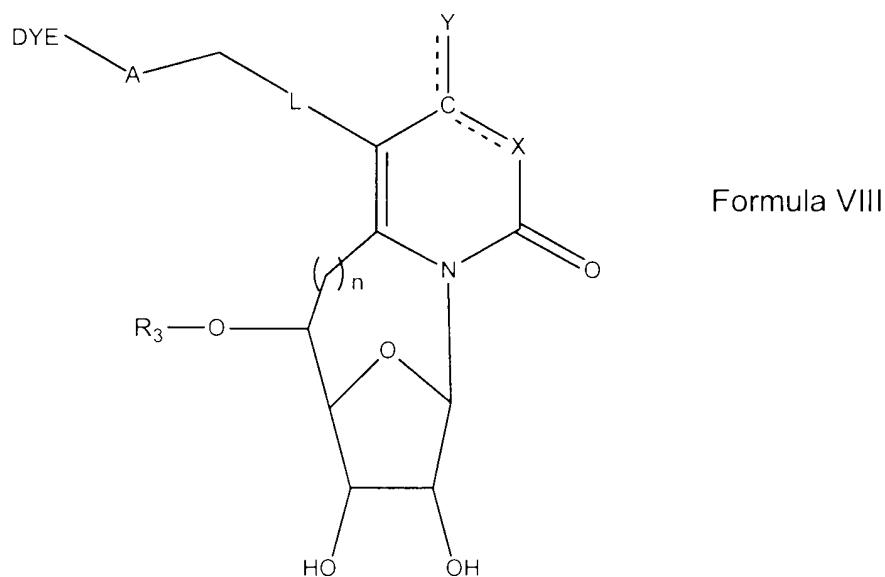
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;

- wherein L is alkyl;

- wherein X is CR or N and Y is O, S, or NH; and

- wherein the dye is any reporter group;

(8) a compound of formula VIII:

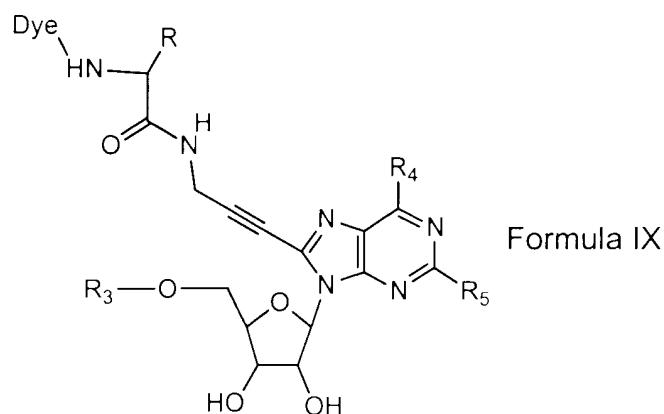


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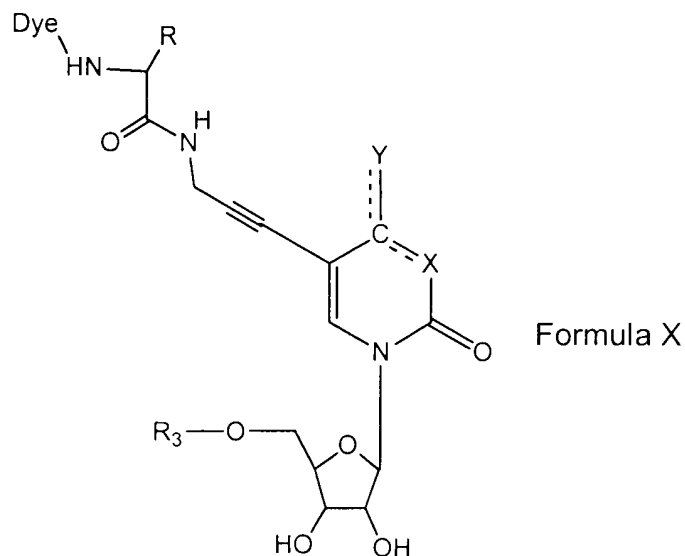
- wherein X is N, NH, or C;
- wherein Y is O or NH<sub>2</sub>;
- wherein R<sub>3</sub> is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein A is O, S, or NH;
- wherein L is alkyl or aryl substituted at from 0 to 3 positions in a chemically reasonable manner with F, Cl, Br, I, C1-C18 alkyl, Silyl, OH, OR', SH, SR', SOR', SO<sub>2</sub>R', SO<sub>3</sub>, or NR'<sub>2</sub>;
- wherein R' is hydrogen or alkyl;
- wherein n is 1 to 10; and
- wherein the dye is any reporter group;

(9) a compound of formula IX:



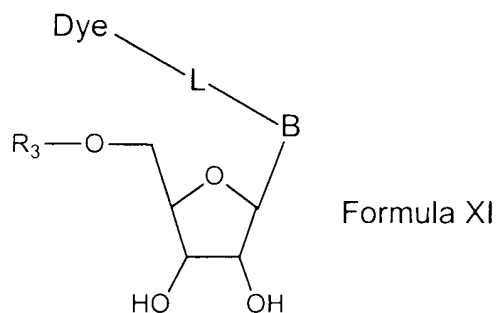
- wherein R<sub>4</sub> is NH<sub>2</sub>, OH, or O and R<sub>5</sub> is NH<sub>2</sub>, OH, or H, provided that if A is NH<sub>2</sub>, B is H and if A is O, B is NH<sub>2</sub>;
- wherein R<sub>3</sub> is either triphosphate,  $\alpha$ -thiotriphosphate, or a salt thereof;
- wherein the dye is any reporter group; and
- wherein R is a side chain for mobility tuning;

(10) a compound of formula X:



- wherein X is N, NH, or C;
- wherein Y is O or NH<sub>2</sub>;
- wherein R<sub>3</sub> is either triphosphate, α-thiotriphosphate, or a salt thereof;
- wherein Dye is any reporter group, and
- wherein R is a side chain for mobility tuning;

(11) a compound of formula XI:



- wherein B is a nucleobase selected from uracil, cytosine, adenine, 7-deazaadenine, guanine, and 7-deazaguanine;
- wherein R<sub>3</sub> is triphosphate or a salt thereof;

- wherein L is a linker selected from propargyl-ethyl-oxide-amino and propargylamino wherein the linker is attached to the 8-C of a adenine, 7-deazaadenine, guanine, or 7-deazaguanine nucleobase, the 7-C or 8-C of a 7-deazaadenine or 7-deazaguanine nucleobase, or the C-5 of a uracil or cytosine nucleobase; and
- wherein Dye is selected from a rhodamine dye and a fluorescein dye.

Claim 128 (new). The method according to claim 108, wherein the reporter group is a rhodamine-type dye, a fluorescein-type dye, an energy transfer dye, or a cyanine-type dye.

Claim 129 (new). The method according to claim 108, further comprising separating the fragments that contain at least one primer from other fragments.

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